

GRAND RAPIDS
All Steel

SASH PULLEYS

CATALOG
H



THE STANDARD FOR FORTY YEARS

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From the collection of:

Michael Lynch, P.E., AIA, FAPT

Grand Rapids All-Steel Sash Pulleys

Today, as during the past 40 years, the words "Grand Rapids" represent the Standard Steel Sash Pulley. Today, as yesterday, "Grand Rapids" means pulley quality, dependability and satisfaction. Assure receiving a tried and proven product by ordering and demanding "Grand Rapids."

• • •

We maintain at all times a very substantial reserve stock and you are assured of prompt service on orders placed. We make a practice of shipping all orders on the day they are received — or promptly on the date specified for shipment.

Established 1898



GRAND RAPIDS, MICHIGAN

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KD Frame Orders

Most of you have used Standard "Grand Rapids" Sash Pulleys in your own mills and yards for many years. You chose them because you knew they were the best you could buy.

If you now order KD frames, you will surely want those same good "Grand Rapids" Pulleys in them. Specify the "Grand Rapids" Pulley you prefer on your KD frame orders. Give the Pulley number clearly and insist on getting genuine "Grand Rapids" Pulleys. They cost no more. You know from experience they are the best.

Forty Years Building Steel Sash Pulleys Exclusively

This organization devotes its entire facilities to doing one thing well. For forty years we have been building steel sash pulleys. The grandsons of men who used our pulleys forty years ago are ordering them today. From father to son the word has been passed along—"You can depend upon "Grand Rapids" for quality at the right price".

Sash Pulleys Tested to Wear 250 Years

A sash equipped with Grand Rapids Steel Sash Pulleys can be raised and lowered the equivalent of one foot every day for 250 years and will still give satisfaction! This has been repeatedly proved by actual tests! It means that Grand Rapids Steel Sash Pulleys can be depended upon to outlast the life of any building.

Grand Rapids Steel Sash Pulleys have deep, smooth wheel grooves and easy running wheels which will not wear the cord. Their long backs or housings prevent the cord from jumping out of the groove. Smooth, quiet, effortless, trouble-free operation is assured.

First in Sales, Proves Satisfaction

The proof of the pudding is in the eating. Grand Rapids Steel Sash Pulleys hold the first position in the world in volume of sales. They have established the standard for quality in the sash pulley field. They lead in design, ease of operation, ease of application, service and durability.



The Four Most Popular "Grand



No. 10 Mahogany

Mahogany Finish

The illustration on the left shows the Mahogany finish which we are prepared to furnish on any "Grand Rapids" Sash Pulleys. This is a baked varnish finish and is both durable and attractive. It will not chip off. Provides ample protection against rust under all ordinary conditions while pulleys are stored, or while frames are exposed to the weather. To indicate Mahogany finish suffix the letter "M" to the pulley style number.

Weather-Proof Finish

This is the well-known finish with black face and transparent lacquered body and wheel we have supplied for years. It is strongly rust resisting and gives perfect satisfaction. All drive pulleys as well as No. 4 and No. 104 thin face screw type pulleys are furnished in Weather-Proof unless otherwise specified.



No. 110 Weather-Proof

Rapids" Rust-Resisting Finishes

Boston Bronze Finish

This finish is similar to Mahogany except in color. Both Boston Bronze and Mahogany are sometimes referred to as "Lacquered finishes", but they are really made from high-grade baking varnish. Add the letter "C" to the pulley number to call for this finish. This finish is standard on No. 16 and No. 17 Pulleys.



No.15 Boston Bronze



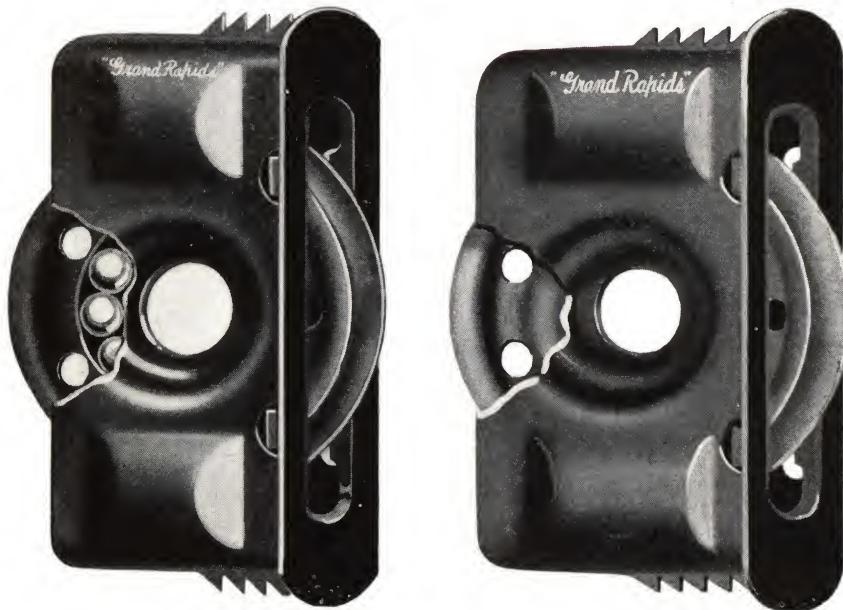
Galvanized Finish

The Electro-Galvanized finish, shown on the left, is uniformly white and highly resistant to rust. It is favored for use in concentrated industrial and salt-water areas where a finish impervious to rust is essential. Indicate this finish by adding "Galv." to the pulley number.

Special Finishes

We are also prepared to furnish Brass Plated (G), Bronze Plated (H), and practically all other special finishes. All pulleys are also available in combinations of Steel with Solid Brass or Bronze faceplates and wheels.

No. 10 Ball-Bearing—No. 110 Cone-Bearing



TYPE OF BEARING

No. 10 Ball Bearing.
No. 110 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Weather Proof furnished unless otherwise specified. For Mahogany finish add letter "M" to number. For Galvanized add "Galv." to number.

FACE PLATE SIZE

1 x 3 inches.

MORTISE

Size $1\frac{1}{2}$ x $2\frac{1}{2}$ inches.
See page 24 for easy mortising details.

PACKING AND WEIGHTS

Ball Bearing

Full Case (100 doz.) 180 lbs.
Half Case (50 doz.) 90 lbs.

Cone Bearing

Full Case (100 doz.) 154 lbs.
Half Case (50 doz.) 78 lbs.

These pulleys have the saw-tooth feature which makes them easy to install. There is nothing to do but drive them in the mortise with the driver we pack in every case.

PRICES—Refer to printed price sheet for current net prices.

No. 9 Ball-Bearing—No. 109 Cone-Bearing



TYPE OF BEARING

No. 9 Ball Bearing.
No. 109 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Weather Proof furnished unless otherwise specified. For Mahogany finish add letter "M" to number. For Galvanized add "Galv." to number.

FACE PLATE SIZE

$1\frac{1}{8}$ x $2\frac{13}{16}$ inches.

MORTISE

Size 1 x $2\frac{1}{2}$ inches.
See page 24 for easy mortising details.

PACKING AND WEIGHTS

Ball Bearing

Full Case (100 doz.) 180 lbs.
Half Case (50 doz.) 90 lbs.

Cone Bearing

Full Case (100 doz.) 153 lbs.
Half Case (50 doz.) 77 lbs.

These pulleys have the saw-tooth feature which makes them easy to install. There is nothing to do but drive them in the mortise with the driver we pack in every case.

PRICES—Refer to printed price sheet for current net prices.

No. 75 Ball-Bearing—No. 175 Cone-Bearing



TYPE OF BEARING

No. 75 Ball Bearing.
No. 175 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Weather Proof furnished unless otherwise specified. For Mahogany finish add letter "M" to number. For Galvanized add "Galv." to number.

FACE PLATE SIZE

$1\frac{1}{8}$ x $2\frac{1}{8}$ inches.

MORTISE

Size $\frac{5}{8}$ x $2\frac{1}{2}$ inches.
See page 25 for easy mortising details.

PACKING AND WEIGHTS

Ball Bearing

Full Case (125 doz.) 207 lbs.
Half Case (60 doz.) 100 lbs.

Cone Bearing

Full Case (125 doz.) 174 lbs.
Half Case (60 doz.) 86 lbs.

These pulleys have the saw-tooth feature which makes them easy to install. There is nothing to do but drive them in the mortise with the driver we pack in every case.

PRICES—Refer to printed price sheet for current net prices.

No. 5 Ball-Bearing—No. 105 Cone-Bearing



TYPE OF BEARING

No. 5 Ball Bearing.
No. 105 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Weather-Proof furnished unless otherwise specified. For Mahogany finish add letter "M" to number. For Galvanized add "Galv." to number.

FACE PLATE SIZE

$1\frac{1}{8}$ x $2\frac{1}{8}$ inches.

MORTISE

Size $\frac{5}{8}$ x $2\frac{1}{2}$ inches.
See page 25 for easy mortising details.

PACKING AND WEIGHTS

Ball Bearing

Full Case (125 doz.) 208 lbs.
Half Case (60 doz.) 102 lbs.

Cone Bearing

Full Case (125 doz.) 178 lbs.
Half Case (60 doz.) 88 lbs.

These pulleys have the tongue fastening. It is more secure than nails or screws and saves their cost. A driver is packed in every case.

PRICES—Refer to printed price sheet for current net prices.

No. 4 Ball-Bearing—No. 104 Cone-Bearing



TYPE OF BEARING

No. 4 Ball Bearing.
No. 104 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Weather-Proof finish is shipped unless another finish is specified.

FACE PLATE SIZE

1 x 3½ inches.

MORTISE

Size 5/8 x 2½ inches.
See page 25 for easy mortising details.

PACKING AND WEIGHTS

Ball Bearing

Full Case (110 doz.) 199 lbs.
Half Case (55 doz.) 104 lbs.

Cone Bearing

Full Case (110 doz.) 165 lbs.
Half Case (55 doz.) 85 lbs.

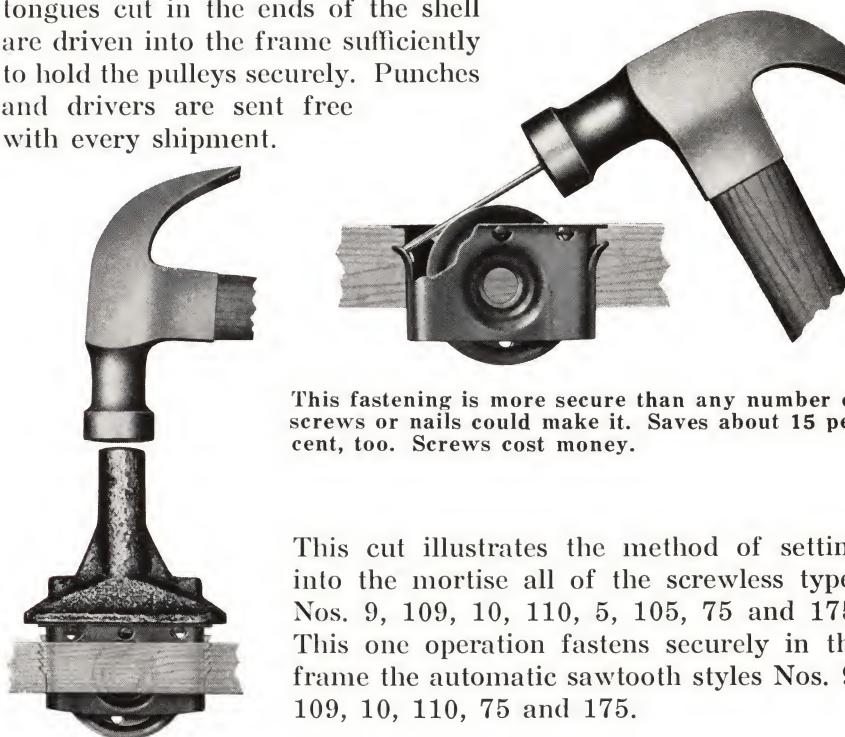
The thin face-plates of these pulleys do not need to be countersunk. They can be used in same mortise as the Nos. 5 and 105 shown on page 9.

PRICES—Refer to printed price sheet for current net prices.

Installing the "Grand Rapids" Automatic Saw-Tooth and Tongue Fastened Sash Pulleys

Make the mortise so the pulley just fits; put the pulley in as far as it will go easily, then place the driver as shown in cut, and one blow from a heavy hammer or maul will drive the face-plate down flush with the surface of the jamb. Do not counter-bore to let the face-plate in the wood. No window can possibly run closely enough to require the thin face-plate to be let in below the surface of the wood—just set the pulley down well as first explained. We send punches and drivers free to every user.

This illustration shows how to fasten into the frame, the tongue fastened pulleys Nos. 5 and 105. They are set into the mortise as described above and with an ordinary nail set or steel punch as shown in the cut, the tongues cut in the ends of the shell are driven into the frame sufficiently to hold the pulleys securely. Punches and drivers are sent free with every shipment.



This fastening is more secure than any number of screws or nails could make it. Saves about 15 per cent, too. Screws cost money.

This cut illustrates the method of setting into the mortise all of the screwless types Nos. 9, 109, 10, 110, 5, 105, 75 and 175. This one operation fastens securely in the frame the automatic sawtooth styles Nos. 9, 109, 10, 110, 75 and 175.

Favorite Residential Size



Numbers

14, 15, 18, 20 and 140

BEARING

The Axle Bearing Wheel is regularly fitted with a sleeve made from the best quality open hearth steel, closely fitting the $\frac{1}{4}$ -inch axle.

Bronze Bushings can be furnished with any of these pulleys.

Wood Bushings, thoroughly waterproofed in a special oil, can be furnished with Nos. 14, 18 and 140 pulleys.

WHEEL

All wheel halves are finished before assembly, thus preventing rust. All sizes will take a No. 8 cord and the No. 20 Pulley will take a No. 10 cord. All "Grand Rapids" wheels have combination grooves for cord or chain.

JAM-PROOF

The wheels are closely enveloped by carefully designed bodies or shells that make it impossible for a cord to get out of the wheel groove.

See opposite page for full specifications.

Axle Bearing Pulleys

Specifications

No. 15 Axle-Bearing

No.	Finish	Wheel (Inches)	Face-Plate (Inches)	Mortise (Inches)
No. 15-C	Boston Bronze Lacquered	1 3/4	1 x 4	5/8 x 2 1/4
No. 15-M	Mahogany Lacquered	1 3/4	1 x 4	5/8 x 2 1/4
No. 15-Gal.	Galvanized	1 3/4	1 x 4	5/8 x 2 1/4

Packed—125 dozen per case, approximately 242 pounds.

Packed—55 dozen per half case, approximately 111 pounds.

No. 14 Axle-Bearing

No.	Finish	Wheel (Inches)	Face-Plate (Inches)	Mortise (Inches)
No. 14-C	Boston Bronze Lacquered	2	1 x 4	1 1/8 x 2 3/8
No. 14-M	Mahogany Lacquered	2	1 x 4	1 1/8 x 2 3/8
No. 14-Gal.	Galvanized	2	1 x 4	1 1/8 x 2 3/8

Packed—100 dozen per case, approximately 208 pounds.

Packed—50 dozen per half case, approximately 109 pounds.

No. 18 Axle-Bearing

No.	Finish	Wheel (Inches)	Face-Plate (Inches)	Mortise (Inches)
No. 18-C	Boston Bronze Lacquered	2	1 x 4 1/2	1 1/8 x 2 3/8
No. 18-M	Mahogany Lacquered	2	1 x 4 1/2	1 1/8 x 2 3/8
No. 18-Gal.	Galvanized	2	1 x 4 1/2	1 1/8 x 2 3/8

Packed—95 dozen per case, approximately 220 pounds.

Packed—45 dozen per half case, approximately 108 pounds.

No. 140 Axle-Bearing

No.	Finish	Wheel (Inches)	Face-Plate (Inches)	Mortise (Inches)
No. 140-C	Boston Bronze Lacquered	2	1 1/8 x 4 1/2	1 1/8 x 2 3/8
No. 140-M	Mahogany Lacquered	2	1 1/8 x 4 1/2	1 1/8 x 2 3/8
No. 140-Gal.	Galvanized	2	1 1/8 x 4 1/2	1 1/8 x 2 3/8

Packed—90 dozen to case, approximately 216 pounds.

Packed—40 dozen to half case, approximately 96 pounds.

No. 20 Axle-Bearing

No.	Finish	Wheel (Inches)	Face-Plate (Inches)	Mortise (Inches)
No. 20-C	Boston Bronze Lacquered	2 1/4	1 1/8 x 4 1/2	1 1/8 x 2 5/8
No. 20-M	Mahogany Lacquered	2 1/4	1 1/8 x 4 1/2	1 1/8 x 2 5/8
No. 20-Gal.	Galvanized	2 1/4	1 1/8 x 4 1/2	1 1/8 x 2 5/8

Packed—75 dozen per case, approximately 211 pounds.

Packed—35 dozen per half case, approximately 96 pounds.

Notice — Mahogany finish is always shipped unless another finish is specified.

Special Finishes — Brass or Bronze face plates can be furnished on any of these pulleys when required.

Nos. 16 and 17—Axe Bearing



OUR SIMPLE METHOD OF MORTISING

MORTISE—Bore five holes with a 1-inch bit, centers $\frac{3}{4}$ inch apart. The two end holes should be only $\frac{1}{16}$ inch deep for ends of face-plate. (See "Grand Rapids" No. 103 Mortiser, page 25.) See diagram page 27.

Recommended for use by those wishing to use a face-plate pulley which can be mortised with moderately priced equipment or with brace and bit. The points on the side of the face-plate provide a marker, which accurately lays out the centers for boring when the latter method is used.

TYPE OF BEARING

Axle Bearing.
Bronze Bushing can be supplied with either size when specified. The No. 17 Pulley can also be furnished with Wood Bushings.

WHEEL SIZE

No. 16— $1\frac{3}{4}$ -inch.
No. 17—2-inch.

FACE PLATE SIZE

1 x 4 inches.

FINISHES

Boston Bronze finish is shipped unless another finish is specified. Mahogany can be supplied at same price.

PACKING AND WEIGHTS

No. 16 (1 $\frac{3}{4}$ -inch)
Full Case (125 doz.) 240 lbs.
Half Case (55 doz.) 109 lbs.

No. 17 (2-inch)
Full Case (100 doz.) 217 lbs.
Half Case (50 doz.) 108 lbs.

PRICES—Refer to printed price sheet for current net prices.

New 1½-Inch Wheel Pulleys for Narrow Mullions

No. 150 CLOSED FACE TYPE
(Face like Pulley on page 16).

No. 151 OPEN FACE TYPE
(Illustrated at left.)



No. 151
Open Wheel Type

WHEEL SIZE:	FACEPLATE:
1 ½-inch.	1x4 ½ inches.
BEARING:	MORTISE:
¼-inch steel axle.	5/8x2 ¼ inches.
FINISH:	

Mahogany shipped unless otherwise ordered.

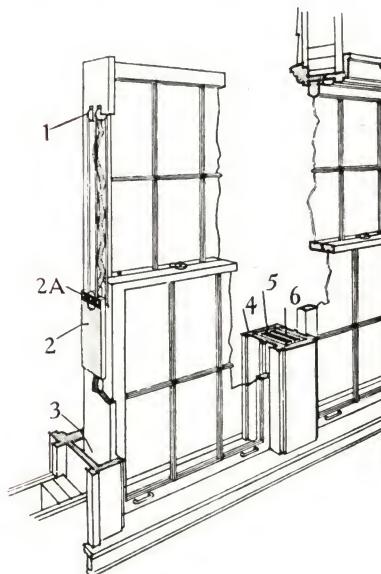
PACKING AND WEIGHTS:

No. 150 (Closed Face)

Full Case (100 doz.) 218 lbs.
Half Case (50 doz.) 110 lbs.

No. 151 (Open Face)

Full Case (100 doz.) 182 lbs.
Half Case (50 doz.) 92 lbs.

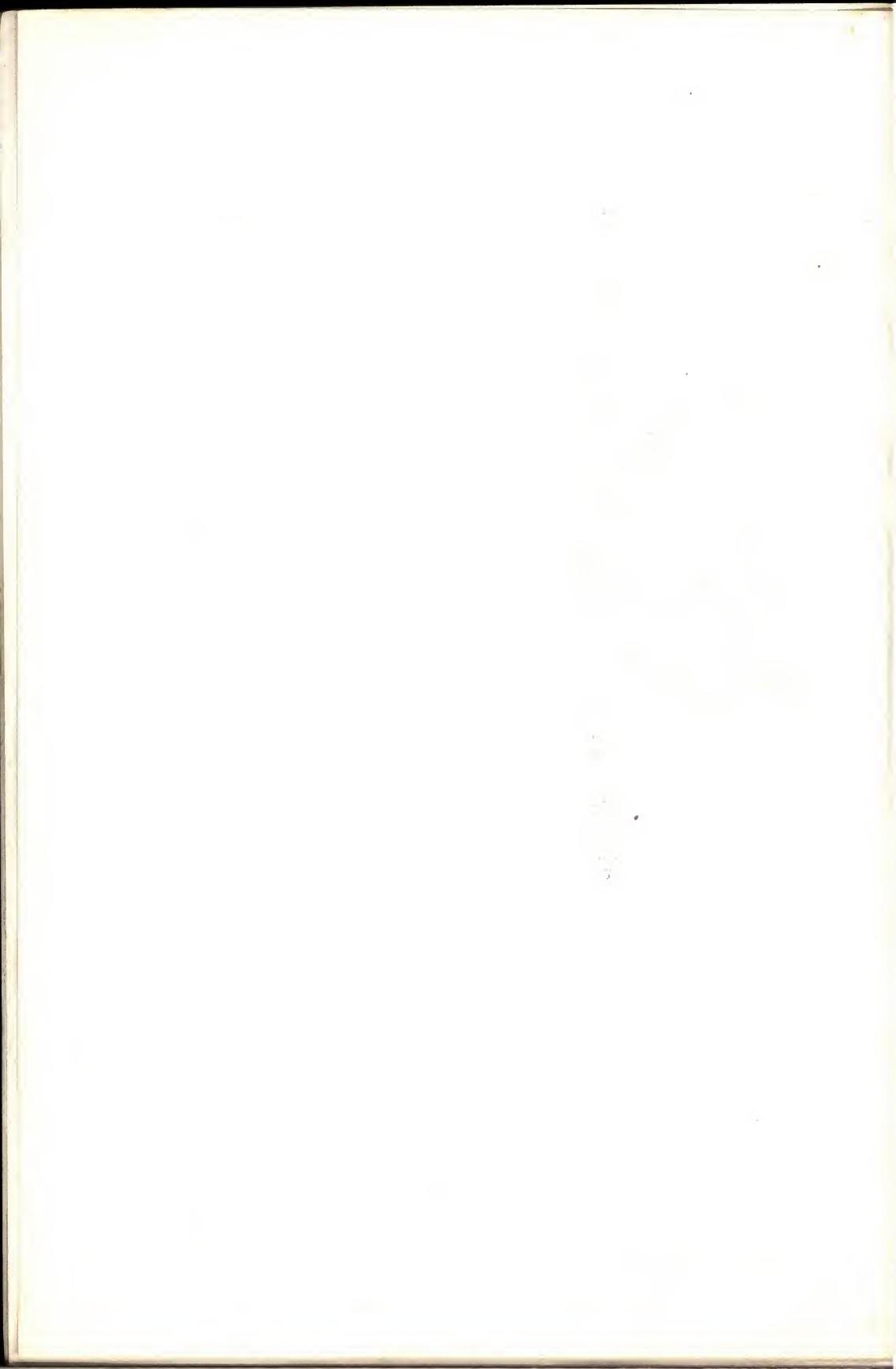


HOW PULLEYS ARE USED WITH FLAT WEIGHTS

In drawing on the right, details are as follows: 1, two pulleys over which one cord or chain runs; 2, new flat weights; 2A, flat weight wheel assembly (made by "Grand Rapids"); 3, weight box; 4, narrow mullion; 5, 6, flat weights.

Note two flat weights take the place of four old style round weights. A very thin metal or wood divider is used between weights.

We shall be glad to give you sources of supply for flat weights.



No. 1 Ball-Bearing—No. 101 Cone-Bearing



TYPE OF BEARING

No. 1 Ball Bearing.
No. 101 Cone Bearing.

WHEEL SIZE

Two Inch Wheel.

FINISHES

Mahogany finish is shipped unless another is specified.

FACE PLATE SIZE

1 x 4½ inches.

(Note different size than in previous catalogs.)

MORTISE

Size ¾ x 2½ inches.

PACKING AND WEIGHTS

Ball Bearing

Full Case (100 doz.) 220 lbs.
Half Case (45 doz.) 102 lbs.

Cone Bearing

Full Case (100 doz.) 198 lbs.
Half Case (45 doz.) 88 lbs.

PRICES—Refer to printed price sheet for current net prices.



In KD Frames

Completely Jam Proof as are all "Grand Rapids" Sash Pulleys.

Pulley Backs are so firmly fastened to Face Plates that a straight side mortise cut on a routing machine can safely be used regardless of the distance of shipment. As strongly constructed as the "Grand Rapids" No. 18 Open Wheel Pulley and requiring no different type of mortise.

No special blocking is required when "Grand Rapids" Enclosed Pulleys are used in KD frames. Thoroughly practical in every detail.

"Grand Rapids"

Nos. 2 and 3 Ball Beari

Bearing

- No. 2 Ball Bearing
- No. 3 Ball Bearing
- No. 102 Cone Bearing
- No. 103 Cone Bearing

Mortise

Body is $\frac{5}{8}$ x $2\frac{1}{16}$ inches. Straight side mortise cut by router is very satisfactory. No special mortise required. Make body mortise fit fairly close at ends, allowing rounded body to relieve screws of part of strain.

Finishes

Regularly shipped in highest grade chip-proof baked Mahogany. Also stocked in rust-resisting Galvanized finish. Brass and Bronze faceplates can also be furnished.

Points of S

Wheel Diameter FULL 2 INCHES

This allows weights to hang clear, assuring quiet sash operation and lengthening cord life. Two-inch wheels have always been standard for residential work.

Full Width of Wheel Groove

The groove takes No. 8 cord without pinching it and without fraying it on the wheel rim. Combination groove for cord or chain.

Easy to Thread

We have left the pulley back partially open to make cord threading a simple matter and prevent cord chafing. The generous width of the back also helps on both points.

Enclosed Sash Pulley

g Nos. 102 and 103 Cone Bearing

Face Plate Size

- No. 2 — $1\frac{1}{8}$ x $4\frac{1}{2}$ inches
- No. 3 —1 x $4\frac{1}{2}$ inches
- No. 102— $1\frac{1}{8}$ x $4\frac{1}{2}$ inches
- No. 103—1 x $4\frac{1}{2}$ inches

Wheel Size

- Two Inch (full size)

Packing and Weights

No. 2

- Full Case (90 doz.) 246 lbs.
- Half Case (40 doz.) 115 lbs.

No. 3

- Full Case (95 doz.) 243 lbs.
- Half Case (40 doz.) 106 lbs.

No. 102

- Full Case (90 doz.) 220 lbs.
- Half Case (40 doz.) 106 lbs.

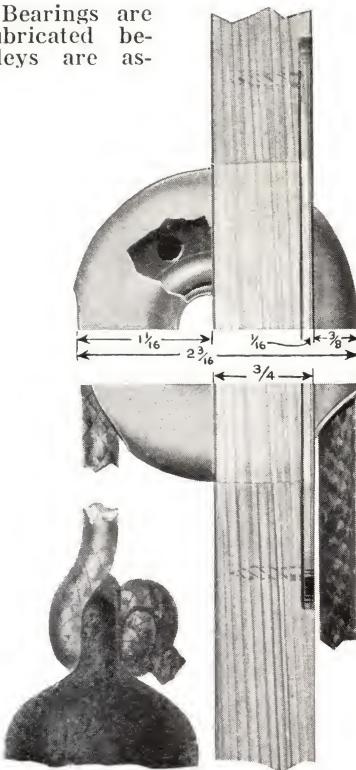
No. 103

- Full Case (95 doz.) 220 lbs.
- Half Case (40 doz.) 94 lbs.

Our large bearing known as the Cone Bearing has been used in the great majority of steel sash pulleys for many years. It distributes the principal strain a pulley bears over a $\frac{7}{8}$ -inch bearing instead of a $\frac{1}{4}$ -inch axle.

The Cone wheel, when carrying a sash and weight, rides perfectly centered on a true rounded housing. No wobbling or side play is possible.

All Cone Bearings are thoroughly lubricated before the pulleys are assembled.



uperiority

Choice of Ball Bearing or Cone Bearing

For about one cent a frame extra, you can have a very effective sales feature and unusually smooth running wheels with eleven $\frac{1}{4}$ -inch Ball Bearings.

Heavy Double Face Plate

Extra strength is provided by this feature. Screw holes are placed well out at the ends to leave plenty of wood between body mortise and screw.

Nose of Pulley Less Than $\frac{3}{8}$ Inch

Even with the full size wheel we have held the cover over it to a satisfactory size for the sash plough. Note the measurement on the illustration. Nose belled out to avoid wearing of cord.

A cut-away section on the pulley above shows the perfectly rounded wheel and housing that form this smooth running bearing.

The Standard Heavy Duty Anti-friction Ball Bearing and

No. 21 and 22 Open Face Pulleys



BEARING

Three-eighths inch steel Axle with solid sleeve steel bushing or Ball Bearing of nine $\frac{3}{4}$ -inch hardened steel balls in a $\frac{5}{8}$ -inch ball race on a solid axle. When specially ordered, Bronze Bushings can be supplied.

FACE-PLATE

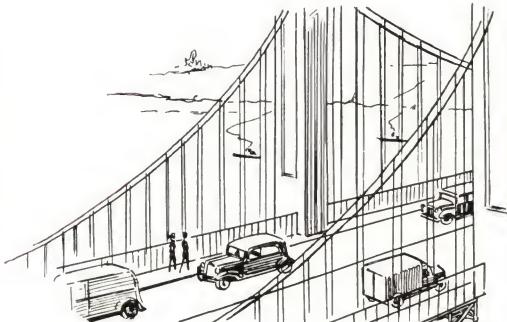
No. 21— $1\frac{1}{8}$ x 5 inches.
No. 22— $1\frac{1}{8}$ x $5\frac{1}{4}$ inches.

WHEEL

No. 21— $2\frac{1}{4}$ inches.
No. 22— $2\frac{1}{2}$ inches.
See page 22 for guarantee.

JAM-PROOF

The carefully planned design of these pulleys makes it absolutely impossible for cord or chain to jump the wheel and jam the pulley.



Built of Enduring Steel

STEEL SASH PULLEY . . .

Anti-friction Axle Bearing

No. 121 Heavy Duty Hooded Pulley

BEARING

Three-eighths inch steel Axle with solid sleeve steel bushing or Ball Bearing of nine $\frac{1}{4}$ -inch hardened steel balls in a $\frac{5}{8}$ -inch ball race on a solid axle. When specially ordered, Bronze Bushings can be supplied.

FACE-PLATE

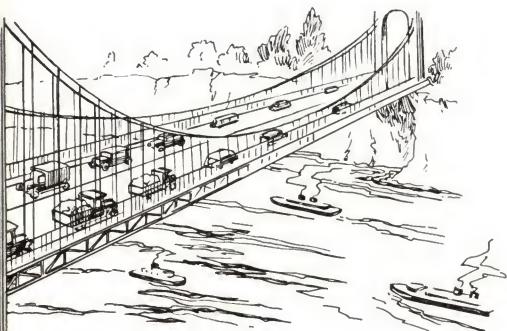
No. 121— $1\frac{1}{4}$ x 5 inches.
Heavy double plate with cover extending beyond plate just over $\frac{3}{8}$ -inch.

WHEEL

No. 121— $2\frac{1}{4}$ inches.
See page 22 for guarantee.

JAM-PROOF

The carefully planned design of these pulleys makes it absolutely impossible for cord or chain to jump the wheel and jam the pulley.



to Carry Heavy Loads

No. 21 Open Wheel and No. 121 Hooded Ball-Bearing Anti-Friction Sash Pulleys

No.	Finish	(Inches) Wheel	(Inches) Face-Plate
No. 21-B and No. 121-B.....	Natural Steel	2 1/4	1 1/8 x 5
No. 21-CB and No. 121-CB.....	Boston Bronze Lacquered	2 1/4	1 1/8 x 5
No. 21-MB and No. 121-MB.....	Mahogany Lacquered	2 1/4	1 1/8 x 5
No. 21-Gal B and No. 121 Gal B.....	Galvanized	2 1/4	1 1/8 x 5
No. 21-DB and No. 121-DB.....	Solid Brass Face-Plate....	2 1/4	1 1/8 x 5
No. 21-EB and No. 121-EB.....	Solid Bronze Face-Plate..	2 1/4	1 1/8 x 5
No. 21-FB and No. 121-FB.....	All Solid Brass.....	2 1/4	1 1/8 x 5
No. 21-GB and No. 121-GB.....	Brass Plated on Steel....	2 1/4	1 1/8 x 5
No. 21-HB and No. 121-HB.....	Bronze Plated on Steel....	2 1/4	1 1/8 x 5
No. 21-IB and No. 121-IB.....	Copper Oxidized on Steel	2 1/4	1 1/8 x 5
No. 21-JB and No. 121-JB	Solid Brass Face-Plate, Solid Brass Wheel.....	2 1/4	1 1/8 x 5
No. 21-KB and No. 121-KB.....	Solid Bronze Face-Plate Solid Brass Wheel.....	2 1/4	1 1/8 x 5

No. 21 Open Wheel and No. 121 Hooded Axle-Bearing Anti-Friction Sash Pulleys

No.	Finish	Wheel (Inches)	Face-Plate (Inches)
No. 21 and No. 121.....	Natural Steel	2 1/4	1 1/8 x 5
No. 21-C and No. 121-C.....	Boston Bronze Lacquered	2 1/4	1 1/8 x 5
No. 21-M and No. 121-M.....	Mahogany Lacquered	2 1/4	1 1/8 x 5
No. 21-Gal and No. 121 Gal.....	Galvanized	2 1/4	1 1/8 x 5
No. 21-D and No. 121-D.....	Solid Brass Face-Plate....	2 1/4	1 1/8 x 5
No. 21-E and No. 121-E.....	Solid Bronze Face-Plate..	2 1/4	1 1/8 x 5
No. 21-F and No. 121-F.....	All Solid Brass.....	2 1/4	1 1/8 x 5
No. 21-G and No. 121-G.....	Brass Plated on Steel....	2 1/4	1 1/8 x 5
No. 21-H and No. 121-H.....	Bronze Plated on Steel....	2 1/4	1 1/8 x 5
No. 21-I and No. 121-I	Copper Oxidized on Steel	2 1/4	1 1/8 x 5
No. 21-J and No. 121-J	Solid Brass Face-Plate, Solid Brass Wheel.....	2 1/4	1 1/8 x 5
No. 21-K and No. 121-K.....	Solid Bronze Face-Plate Solid Brass Wheel.....	2 1/4	1 1/8 x 5

No. 21-B—Natural Steel Ball-Bearing packed in cases 60 dozen.

No. 21—Natural Steel Axle-Bearing packed in cases 60 dozen.

In Solid Brass, Solid Brass Face-Plate and all Plated finishes, either Axle- or Ball-Bearing, each pulley is wrapped and packed in one dozen cartons.

These cartons are packed in cases of 15 dozen each.

No. 21 and No. 121—Ball-Bearing and Axle-Bearing Pulleys, lacquered finishes, are packed in cases of 30 dozen and 25 dozen respectively.

	Cases 60 Doz.	Cases 30 Doz.	Cases 15 Doz.
No. 21 Ball-Bearing style	238 lbs.	127 lbs.	74 lbs.
No. 21 Axle-Bearing style	227 lbs.	120 lbs.	72 lbs.
		Cases 25 Doz.	Cases 15 Doz.
No. 121 Ball-Bearing style		122 lbs.	72 lbs.
No. 121 Axle-Bearing style		113 lbs.	67 lbs.

In ordering please use above style numbers and letter indicating finish. All shipments via freight unless otherwise ordered.

No. 22 Open Wheel Ball-Bearing Anti-Friction "Grand Rapids"

No.	Finish	Wheel (Inches)	Face-Plate (Inches)
No. 22-B	Natural Steel	2½	1½ x 5¼
No. 22-CB	Boston Bronze Lacquered.....	2½	1½ x 5¼
No. 22-MB	Mahogany Lacquered	2½	1½ x 5¼
No. 22-Gal	Galvanized	2½	1½ x 5¼
No. 22-DB	Solid Brass Face-Plate	2½	1½ x 5¼
No. 22-EB	Solid Bronze Face-Plate.....	2½	1½ x 5¼
No. 22-FB	All Solid Brass.....	2½	1½ x 5¼
No. 22-GB	Brass Plated on Steel.....	2½	1½ x 5¼
No. 22-HB	Bronze Plated on Steel.....	2½	1½ x 5¼
No. 22-IB	Copper Oxidized on Steel.....	2½	1½ x 5¼
No. 22-JB	Solid Brass Face-Plate, Solid Brass Wheel.....	2½	1½ x 5¼
No. 22-KB	Solid Bronze Face-Plate, Solid Brass Wheel..	2½	1½ x 5¼

No. 22 Open Wheel Axle-Bearing Anti-Friction "Grand Rapids"

No.	Finish	Wheel (Inches)	Face-Plate (Inches)
No. 22	Natural Steel	2½	1½ x 5¼
No. 22-C	Boston Bronze Lacquered.....	2½	1½ x 5¼
No. 22-M	Mahogany Lacquered	2½	1½ x 5¼
No. 22-Gal	Galvanized	2½	1½ x 5¼
No. 22-D	Solid Brass Face-Plate	2½	1½ x 5¼
No. 22-E	Solid Bronze Face-Plate.....	2½	1½ x 5¼
No. 22-F	All Solid Brass.....	2½	1½ x 5¼
No. 22-G	Brass Plated on Steel.....	2½	1½ x 5¼
No. 22-H	Bronze Plated on Steel.....	2½	1½ x 5¼
No. 22-I	Copper Oxidized on Steel.....	2½	1½ x 5¼
No. 22-J	Solid Brass Face-Plate, Solid Brass Wheel.....	2½	1½ x 5¼
No. 22-K	Solid Bronze Face-Plate, Solid Brass Wheel..	2½	1½ x 5¼

Packages—Quantities—Weights—No. 22

No. 22-B—Natural Steel Ball-Bearing packed in cases 50 dozen each.

No. 22 —Natural Steel Axle-Bearing packed in cases 50 dozen each.

In Solid Brass, Solid Brass Face-Plate and all Plated finishes, either Axle- or Ball-Bearing, each pulley is wrapped and packed in one dozen cartons. These cartons are packed in cases of 15 dozen each.

No. 22 Ball-Bearing and Axle-Bearing Pulleys in Lacquered finishes are packed in cases of 25 dozen each.

Weights as Follows:

	Cases 50 Doz.	Cases 25 Doz.	Cases 15 Doz.
Ball-Bearing style	226 lbs.	120 lbs.	78 lbs.
Axle-Bearing style	220 lbs.	114 lbs.	75 lbs.

In ordering please use above style numbers and letter indicating finish. All shipments via freight unless otherwise ordered.

Anti-Friction Heavy Duty Wheels



Ball-Bearing Anti-Friction Wheel
used in Nos. 21, 22 and 121 pulleys.

STRONGLY CONSTRUCTED

The wheels used in No. 21, 22, and 121 Pulleys are made to carry much heavier weights than they will ever be called on to support. Dead weights that will snap a regular size cord can be hung on them without damaging them in the least.

BALL OR AXLE BEARING

Note the heavy $\frac{3}{8}$ -inch axle and the sleeve that turns around it. That sleeve is clinched firmly on the wheel in three places. It cannot possibly work loose from the wheel.

Full details on both types of bearings on pages 18 and 19.



Axe-Bearing Anti-Friction Wheel
used in Nos. 21, 22 and 121 pulleys.

WHEEL GROOVE

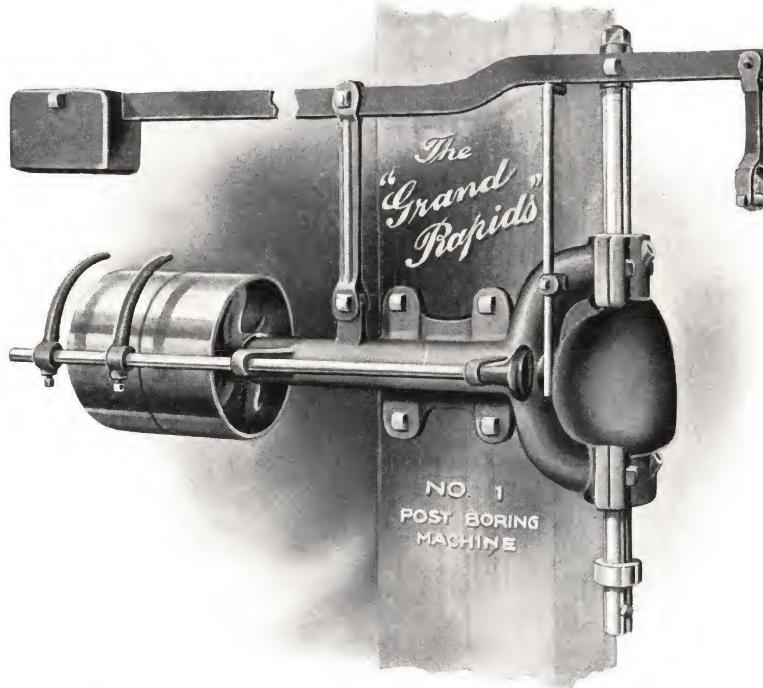
The Combination Groove takes a No. 45 American chain or a No. 10 cord freely. It is deep and the chain or cord cannot jump it.

GUARANTEE

We guarantee all "Grand Rapids" Heavy Duty Sash Pulleys to satisfactorily carry any sash made.

Ask for samples in any finishes you would like to see.

No. 1
“Grand Rapids” Post Boring Machine



A Machine for General Work as Well as for Operating
Sash Pulley Mortisers

A well made machine that will pay for itself in any shop. Has tight and loose pulleys, $3\frac{1}{4} \times 7$, which should run about 600 revolutions per minute. The machine is equipped with belt shifter, shown on the side, and an adjustable stop for depth of hole. Also has adjustable counter balance on lever. Anyone can arrange a simple foot treadle for bringing down the vertical spindle if such a device is wanted. The chuck is fitted with a hole to take tools with straight shank $\frac{1}{2}$ -inch diameter. Either adjustable or stationary table can be supplied. Shipping weight about 135 pounds.

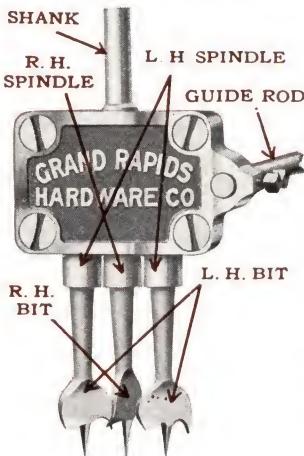
“GRAND RAPIDS”

Sash Pulley Mortisers are Faster than Any Other Pulley Mortiser Made

These mortisers are fitted, unless otherwise ordered, with $\frac{1}{2}$ -inch straight shank, and are suitable for use in any belt power machine, but not for hand brace.

When run about 600 revolutions per minute, these mortisers make a perfect mortise. No cutting, trimming nor fitting is necessary.

Shipped via express unless ordered with sash pulleys. Shipping weight, $4\frac{1}{2}$ pounds.



No. 11 “Grand Rapids” Triple Sash Pulley Mortiser

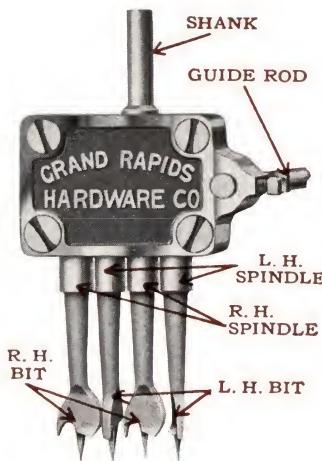
Bores three 1-inch holes, centers $\frac{3}{4}$ inch apart, making at one punch a perfect mortise for Nos. 9 and 109 pulleys shown on page 7. The center spindle (or gear) and the bit inserted in it are threaded right hand. The two outside spindles and bits are threaded left hand. In ordering parts, either send the old parts or state whether the bit or spindle is right or left hand.

No. 12 “Grand Rapids” Quadruple Sash Pulley Mortiser

Bores four $13/16$ -inch holes, centers $\frac{5}{8}$ inch apart, and makes a mortise of proper size for Nos. 10 and 110 pulleys shown on page 6.

The driving spindle (or gear), also the second one removed from it and the bits inserted in them are threaded right hand. The other two spindles and bits inserted in them are threaded left hand.

In ordering parts specify whether they are to be threaded right or left hand.



“GRAND RAPIDS”

Sash Pulley Mortisers are Faster than Any Other Pulley Mortiser Made

These mortisers are fitted, unless otherwise ordered, with $\frac{1}{2}$ -inch straight shank, and are suitable for use in any belt power machine, but not for hand brace.

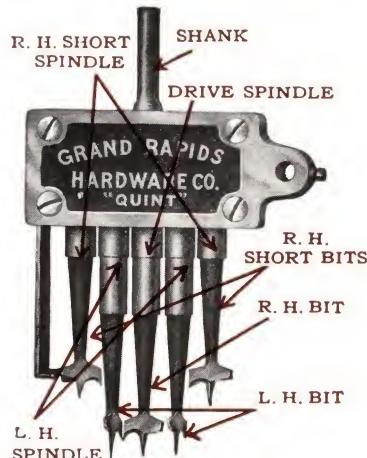
When run about 600 revolutions per minute, these mortisers make a perfect mortise. No cutting, trimming nor fitting is necessary.

Shipped via express unless ordered with sash pulleys. Shipping weight, No. 103 “Quint,” $6\frac{1}{2}$ pounds; No. 105, “Quadruple,” $4\frac{1}{2}$ pounds.

No. 103 “Grand Rapids” Quint Mortiser

Bores five 1-inch holes, center $\frac{3}{4}$ inch apart, making at one punch a perfect mortise for Nos. 16 and 17 pulleys shown on page 14.

The driving spindle (or gear) and two short outside spindles and the bits in them are threaded right hand. The two spindles and bits next to the center one are threaded left hand. Specify thread (right or left hand) in ordering parts.

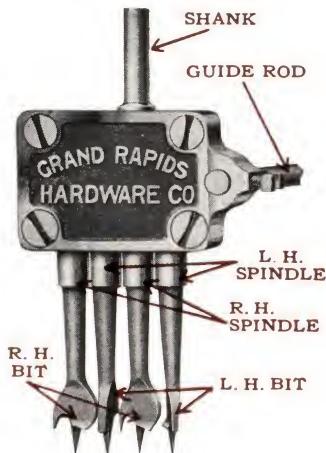


No. 105 “Grand Rapids” Quadruple Sash Pulley Mortiser

Bores four $13/16$ -inch holes, centers $9/16$ inch apart, and makes a mortise of proper size for Nos. 4, 104, 5, 105, 75 and 175 pulleys shown on pages 8 and 10.

The driving spindle (or gear), also the second one removed from it and the bits inserted in them are threaded right hand. The other two spindles and bits inserted in them are threaded left hand.

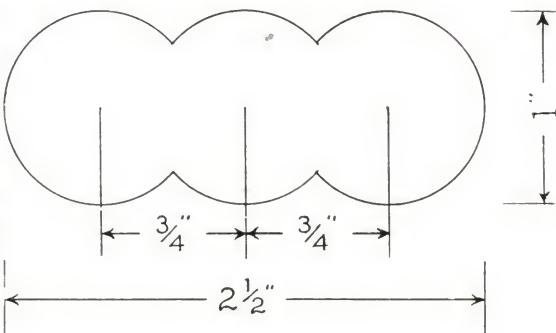
We suggest sending old parts to be duplicated when ordering parts. Otherwise specify whether right or left hand thread is required.



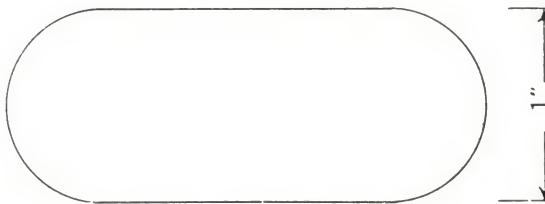
Sash Pulleys Nos. 9 and 109

Shown on page 7, fit mortises as shown below

The diagram on the right shows the detail of a mortise made by boring three 1-inch holes in line, centers $\frac{3}{4}$ inch apart. This can be done with a brace and bit or with a power boring machine. We furnish free a marker to lay out the centers for boring. The No. 11 Triple Mortiser shown on page 24 makes this mortise complete at one operation.



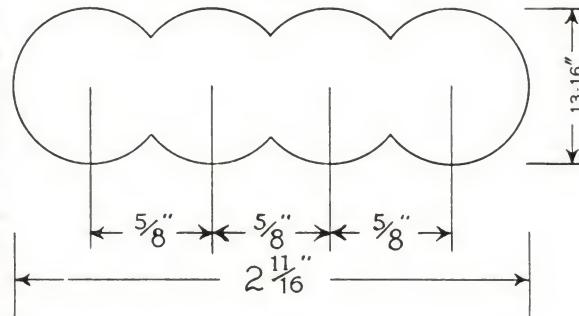
The diagram on the left shows the detail of a mortise made with a routing machine, using a 1-inch bit.



Sash Pulleys Nos. 10 and 110

Shown on page 6, requires mortise as shown below

The diagram on the right shows the detail of a mortise made by boring four $\frac{5}{8}$ -inch holes in line, centers $\frac{5}{8}$ inch apart, with brace and bit or power boring machine. We furnish free a marker to lay out the centers for boring. The No. 12 Quadruple Mortiser shown on page 24 makes this mortise complete at one operation.



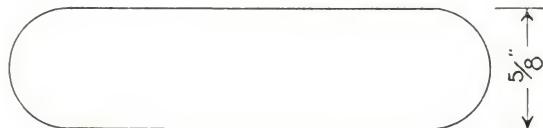
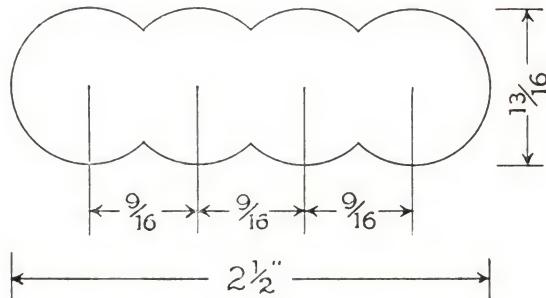
The diagram on the left shows the detail of a mortise made with a routing machine, using a $\frac{5}{8}$ -inch bit.



Sash Pulleys Nos. 5, 105, 75 and 175

Shown on pages 8 and 9, fit mortises shown below
The Nos. 4 and 104, shown on page 10, also fit these mortises

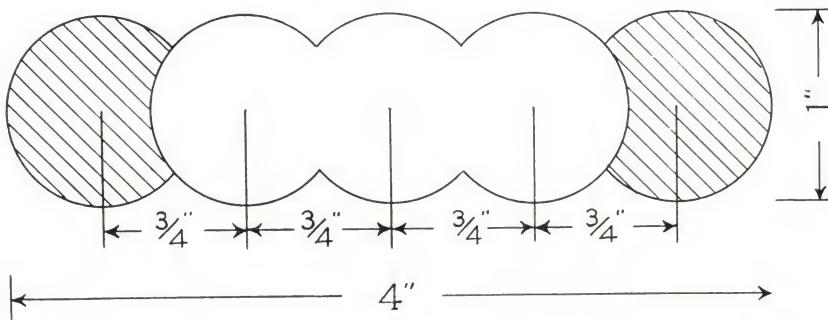
The diagram on right shows the detail of a mortise made by boring four $\frac{9}{16}$ -inch holes, centers $\frac{9}{16}$ inch apart, with brace and bit, or power boring machine. The No. 105 Quadruple Mortiser shown on page 25 makes this mortise complete at one operation.



The diagram on left shows the detail of a mortise made with a routing machine, using a $\frac{5}{8}$ -inch bit.

Sash Pulleys Nos. 16 and 17

Shown on page 14, require a mortise as shown below



Bore five holes in line, 1 inch diameter, centers $\frac{3}{4}$ inch apart, with brace and bit or power boring machine. The three holes in the center are bored clear through and the two end ones only $\frac{1}{16}$ inch deep to countersink ends of face-plate. The face-plate of these pulleys are formed with points on one side, which provides a marker for laying out the centers.

The No. 103 Quint Mortiser shown on page 25 makes this mortise complete at one operation.

Bearings



Bronze Bearing

Bronze Bearing

The Bronze bearing shown on the left can be furnished in Sash Pulleys Nos. 16, 17, 15, 14, 18, 140 and 20, shown on pages 12, 13 and 14. This form of bearing is used in high-grade machinery. Anti-friction, smooth-running and everlasting. Needs no lubrication. See price list.



Steel Bearing

Steel Bearing

Unless otherwise specified the Steel bearing is regularly furnished in the Axle-Bearing styles. Made from the best quality open hearth steel.



Wood Bearing

Wood Bearing

This Wood bearing can be furnished in Sash Pulleys Nos. 14, 17, 18 and 140, shown on pages 12, 13 and 14. Made from hard dry maple, thoroughly impregnated with oil. Noiseless and permanently lubricated. See price list.

Ball-Bearing—Cone-Bearing



Ball-Bearing

THE BALL BEARING

This sectional view shows the Ball-Bearing used in the "Grand Rapids" Sash Pulleys Nos. 1, 2, 3, 4, 5, 9, 10 and 75. The bearing contains eleven $\frac{1}{4}$ -inch solid steel balls **packed in lubricant**. Note the large bearing surface, giving greater strength and durability than the ordinary small axle or ball-bearing.

This bearing is guaranteed to run under a load longer than any other steel pulley. An exclusive "Grand Rapids" feature.

THE CONE BEARING

Six circular eyelets fasten the two sides of the wheel together. These eyelets are swedged down tightly on the principle of a shoe eyelet, holding the sides together securely. This wheel cannot be split apart by a weight sufficient to break the ordinary sash cord or chain. The large $\frac{5}{8}$ -inch bearing gives perfect alignment to the wheel, making the pulley absolutely noiseless.



Cone-Bearing

Centralizing wear is induced between the cone formed on the inner circumference of the wheel and the sides of the casing, which are securely swedged together. Perfect alignment of the wheel at all times is assured. Another exclusive "Grand Rapids" feature.

How We Help Sell Frames for “Grand Rapids” Ball Bearing Sash Pulley Users

To every customer furnishing genuine “Grand Rapids” Ball Bearing Sash Pulleys in its frames, we supply, without charge, two rubber stamps.

One of these is used on the frames, the other on invoices, quotations, etc. The stamps state that the frames you sell are equipped with Ball Bearing “Grand Rapids” Sash Pulleys. You know what the “Grand Rapids” name has meant for forty years to the carpenter and contractor, and you know every purchaser recognizes that ball bearings mean easy, silent operation.

“Grand Rapids” Comparative Pulleys for Government Specifications

Standard FF-H-111 Specification	“GRAND RAPIDS” COMPARATIVE SASH PULLEYS Special Finishes for Government Projects	
	2 1/4" Wheel Pulley	2 1/2" Wheel Pulley
1249-C Steel Axle Bearing Pulleys	21-G Gov't Special (Brass plated face and wheel, weather-proof back) 21-H Gov't Special (Bronze plated face and wheel, weather - proof back)	22-G Gov't Special (Brass plated face and wheel, weather - proof back) 22-H Gov't Special (Bronze plated face and wheel, weather - proof back)
1249-D Steel Ball Bearing Pulleys	21-GB Gov't Special (Brass plated face and wheel, weather - proof back) 21-HB Gov't Special (Bronze plated face and wheel, weather - proof back)	22-GB Gov't Special (Brass plated face and wheel, weather - proof back) 22-HB Gov't Special (Bronze plated face and wheel, weather - proof back)
1250-C Steel and Bronze Ball-Bearing Pulleys	21-EB Gov't Special (Solid Bronze face and wheel, weather - proof back)	22-EB Gov't Special (Solid Bronze face and wheel, weather - proof back)

The government numbers for cast-iron specifications that can often be changed to “Grand Rapids” Pulleys are as follows:

Type 1249 (cast) change to Type 1249-C (GR)
 Type 1249-A (cast) change to Type 1249-D (GR)
 Types 1250-A, 1250-B (cast) change to Type 1250-C (GR)

Ask for special price list on Government Pulleys.

Useful Information

Caution — Use the Size of Pulley Suited to the Frame

$\frac{7}{8}$ " Pulley Stiles Require 2" Wheels

$1\frac{1}{8}$ " Pulley Stiles Require 2 $\frac{1}{4}$ " Wheels

$1\frac{3}{8}$ " Pulley Stiles Require 2 $\frac{1}{2}$ " Wheels

Sizes of Weights Required for Following Windows:

Two-Light Windows	S.S.	D.S.	Two-Light Windows	S.S.	D.S.	Two-Light Windows	S.S.	D.S.
16 x 20	3	3 $\frac{1}{2}$	24 x 20	4 $\frac{1}{2}$	5	30 x 20	6	6
16 x 24	3 $\frac{1}{2}$	4	24 x 24	5	5 $\frac{1}{2}$	30 x 24	6 $\frac{1}{2}$	7
16 x 26	4	4 $\frac{1}{2}$	24 x 26	5 $\frac{1}{2}$	6	30 x 26	6 $\frac{1}{2}$	7 $\frac{1}{2}$
16 x 28	4	4 $\frac{1}{2}$	24 x 28	6	6 $\frac{1}{2}$	30 x 28	7	7 $\frac{1}{2}$
16 x 30	4 $\frac{1}{2}$	5	24 x 30	6 $\frac{1}{2}$	7	30 x 30	7 $\frac{1}{2}$	8
			24 x 32	6 $\frac{1}{2}$	7 $\frac{1}{2}$	30 x 32	8	8 $\frac{1}{2}$
18 x 20	3 $\frac{1}{2}$	4						
18 x 24	4	4 $\frac{1}{2}$	26 x 20	5	5 $\frac{1}{2}$	32 x 20	6	6 $\frac{1}{2}$
18 x 26	4 $\frac{1}{2}$	5	26 x 24	5 $\frac{1}{2}$	6	32 x 24	6 $\frac{1}{2}$	7
18 x 28	4 $\frac{1}{2}$	5	26 x 26	6	6 $\frac{1}{2}$	32 x 26	7	7 $\frac{1}{2}$
18 x 30	5	5 $\frac{1}{2}$	26 x 28	6	6 $\frac{1}{2}$	32 x 28	7 $\frac{1}{2}$	8
			26 x 30	6 $\frac{1}{2}$	7 $\frac{1}{2}$	32 x 30	8	8 $\frac{1}{2}$
20 x 20	4	4 $\frac{1}{2}$	26 x 32	7	8			
20 x 24	4 $\frac{1}{2}$	5						
20 x 26	5	5 $\frac{1}{2}$	28 x 20	5 $\frac{1}{2}$	6	36 x 20	6 $\frac{1}{2}$	7
20 x 28	5 $\frac{1}{2}$	6	28 x 24	6	6 $\frac{1}{2}$	36 x 24	7	8
20 x 30	5 $\frac{1}{2}$	6	28 x 26	6	7	36 x 26	8	8 $\frac{1}{2}$
			28 x 28	6 $\frac{1}{2}$	7	36 x 28	8	9
24 x 16	3 $\frac{1}{2}$	4	28 x 30	7	7 $\frac{1}{2}$	36 x 30	8 $\frac{1}{2}$	
24 x 18	4	4 $\frac{1}{2}$	28 x 32	7 $\frac{1}{2}$	8			9 $\frac{1}{2}$

Samson Spot Sash Cord Table

No.	Diameter Inch	Feet per Pound	For Weights Pounds	No.	Diameter Inch	Feet per Pound	For Weights Pounds
6	$\frac{6}{32}$	66	5 and less	9	$\frac{9}{32}$	36	20 to 30
7	$\frac{7}{32}$	55	5 to 12	10	$\frac{10}{32}$	27	30 to 40
8	$\frac{8}{32}$	44	12 to 20	12	$\frac{12}{32}$	20	40 to 50

Number of Feet of Cord Required Per Opening

Double height of opening and add 8 feet per window 6 feet high or less.
Add 10 feet per window 7 feet high or over.

Number of feet of sash chain or ribbon 2 feet less per opening than cord.

BE SURE that sufficient length of cord is allowed, otherwise the weight will be drawn against the pulley with danger of breaking it.

Weights for upper sash should be $\frac{1}{2}$ pound heavier, and lower sash $\frac{1}{2}$ pound lighter than net weight of sash.

Note: We do not sell sash weights of cord.

You, the Customer, Must be Satisfied

Our interest in a transaction does not end with the shipment of goods—you must be satisfied. We consider that the real boss of our organization is the customer. We are working for you and with you.

If for any reason within our control your "Grand Rapids" Sash Pulleys do not reach you in good condition, we will consider it a favor if you will notify us immediately and give us an opportunity to replace anything that is not up to our usual standard or make any other necessary adjustment.

If your shipment is damaged in transit, make sure that a proper notation of the damage is made on the freight expense bill and unless you prefer to do this yourself, we will enter a claim for you against the transportation company. We are not responsible for damage incurred while goods are in transit, but we are glad to be of service to our customers in recovering such damage and will give all possible assistance in doing this.

You will find that each package shipped you contains the correct number of pulleys, as we use every precaution known to us to prevent shortages in the count or other things of this nature which might cause annoyance or inconvenience to you.

We will welcome any time your advice and suggestions for the improvement of our product.

